

ABSTRACT

A new optical lithographic exposure apparatus is described. The apparatus may comprise, for example, a lithographic stepper or scanner. A wafer stage comprises a means of supporting a semiconductor wafer. A mask stage comprises a means of holding a first mask and a second mask and maintaining a fixed relative position between the first mask and the second mask. The mask stage may further comprise an independent means of aligning each mask. A light source comprises a means to selectively shine actinic light through one of the first mask and the second mask. An imaging lens is capable of focusing the actinic light onto the semiconductor wafer. A step and scan method using the mask stage is provided. A first mask and a second mask are loaded into a mask stage of an optical lithographic exposure apparatus. The first mask and the second mask are aligned. The first mask is scanned. The wafer is then stepped. The second mask is scanned. By repeating this sequence across the wafer twice, the patterns of the first mask and the second mask are thereby superimposed in every field. The photoresist layer is developed to thereby create the patterning in the manufacture of the integrated circuit device.